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TITLE: MANUFACTURE OF CONTROL KNOB

PUBN-DATE: November 1, 1991

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APPL-NO: JP02188034

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ABSTRACT:

PURPOSE: To enable fine work with hard material in manufacturing a control knob for an automobile air conditioner by molding an upper-side and front-side opening member to fit and hold a control lever with light transmitting resin and insert-molding the member with light transmitting resin so as to cover the openings thereof.

CONSTITUTION: A knob 3 is made up of a primary-side member 16 of light transmitting synthetic resin and a secondary-side member 17 of light transmitting synthetic resin. The primary-side member 16 has a recessed portion 25 to which a control lever is fitted and an engaging groove 24 with which the engaging protrusion of the control lever is engaged, and molded with a pair of longitudinally split type primary molds in such a shape that the upper face and the front face are open. The primary-side member 16 is set in a longitudinally split type secondary mold for molding the secondary-side member 17 and insert-molded, mold the secondary-side member 17 so as to cover the opening of the primary-side member 16. In this way, hard material can be used and fine work can be done.

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明 細 書

1. 発明の名称

コントロールノブの製造方法

2. 特許請求の範囲

(1) コントロールレバー1の先端部に形成された弾性係合突起13に係合して、コントロールレバー1の先端部に取り付けられるコントロールノブ3の製造方法において、

コントロールレバー1の先端部を嵌合する凹部25と弾性係合突起13に係合する係合用溝部24を設け、少なくとも上側と前側とを開放するように、硬質の透光性材料を用いて一对の割型で構成される第1の金型にて一次側部材16を成形し、

この一次側部材16を、凹部25及び開放端を閉塞するとともに係合用溝部24を上方から覆うようにした状態で、一对の割型で構成される第2の金型の一方の割型に嵌めた後、他方の割型を一方の割型に合わせ、透光性の樹脂材料にて一次側部材をインサートモールドして後端部に開口穴を備えた二次側部材を成形したことを特徴とするコ

ントロールノブの製造方法。

3. 発明の詳細な説明

[産業上の利用分野]

本発明は自動車の空調装置等のコントロールノブの製造方法に関する。

[従来の技術]

従来、例えば自動車用空調装置のコントロール装置として、装置本体にコントロールレバーを回転自在に支持するとともに、該コントロールレバーの先端に合成樹脂製のノブを取り付け、該ノブを把持してコントロールレバーを回転操作することにより、空調装置から噴出される風和空気の温度或は噴出し位置等を制御するように構成したものがよく知られている。

[発明が解決する問題点]

ところで、従来、ノブはビス止めによってコントロールレバーに取り付けられるが、その場合は、取り付けが煩雑で見映えも悪くなるとともに、部品点数が増すという問題があった。

そこで、ノブ側に係合用溝部を、レバー側に、

上記溝部に係入する係合用突起を設け、ノブをレバーにワンタッチ嵌合する方法が提案されている。ところが、かかる方法によれば、ノブのレバー嵌合用凹部の開口部から離れた位置に、上記溝部を形成する必要があるため、ノブの形成が困難になるという問題がある。すなわち、上記溝部は、具体的には無理抜き、スライドコア等の方向で形成されるが、前者の方法は硬い材料には適さず、後者の方法では細かい溝加工が難しい。

[問題点を解決するための手段]

上記不具合点を解消するため、本発明は、コントロールレバーの先端部に形成された弾性係合突起に係合して、コントロールレバーの先端部に取り付けられるコントロールノブの製造方法において、

コントロールレバーの先端部を嵌合する凹部と弾性係合突起に係合する係合用溝部を設け、少なくとも上側と前側とを開放するように、硬質の透光性材料を用いて一対の割型で構成される第1の金型にて一次側部材を成形し、

ので、コントロールノブに硬い材料を使用する場合や、係合用溝部が小さいような場合にも、無理抜き、スライドコア等の手段を用いることなく、一対の金型による通常の成形方法で、コントロールノブを容易に製造できるようになり、且つ係合用溝部の寸法精度も向上するようになる。

又、コントロールレバーとコントロールノブに、夫々位置決め用の突出部と段部とを設ければ、レバーとノブが確実に位置決めされて、両者間でのがたつきが減少するようになる。

[実施例]

第3図には、本発明の実施例に係る自動車用空調装置のコントロール装置が示されている。該装置は、不図示の基板によって回動自在に支持される合成樹脂製のコントロールレバー1と、パネル2の外方で、コントロールレバー1の先端部に取り付けられるコントロールノブ3とを有する。該コントロールノブ3は合成樹脂で形成され、その内部には、夜間等にノブ3の位置を表示するための発光ダイオード4が収容されている。

この一次側部材を、凹部及び開放端を閉塞するとともに係合用溝部を上方から覆うようにした状態で、一対の割型で構成される第2の金型の一方の割型に嵌めた後、他方の割型を一方の割型に合わせ、透光性の樹脂材料にて一次側部材をインサートモールドして後端部に開口穴を備えた二次側部材を成形している。

[発明の効果]

本発明では、ワンタッチ嵌合式のコントロールノブを二重成形し、コントロールレバーとの係合用溝部を該溝部の少なくとも一方の端部に対応する側が開放された一次側部材に設けるようにした

上記コントロールレバー1は、ロッド等の連結部材(不図示)を介して空調装置本体に連結され、ノブ3による回動操作によって、例えば、調和空気の温度を調節しうるようになっている。又、上記パネル2には、コントロールレバー1を回動自在に案内する長穴5が明けられている。

上記コントロールレバー1の上面側には、その長手方向に沿う溝6が設けられている。コントロールノブ3への嵌合部位において、溝6は円筒状に形成され、この円筒部に発光ダイオード4が挿入されるとともに、該円筒部には発光ダイオード4の上部に当接して発光ダイオード4の径方向の動きを阻止する保持突起7が一体に設けられている。

溝6の上記発光ダイオード挿入部位より前方には、その中央部にリブ8が形成され、該リブ8によって溝6が左右に分割されている。発光ダイオード4からは、左右1対のリード線10、10が引き出され、これらリード線10、10は、リブ8の両側の溝6内を伸び、更に溝6に連続してレ

バー1の立上り部11に明けたトンネル部12、12を貫通して不図示の電源に接続される。

レバー1のノブ3との接続部位には、その高さ方向の全域から斜め前方へ張り出す、可撓な係合用弾性部13と、その上端部から側方へ張り出す位置決め用突出部14とが、夫々レバー1と一体に、前後に設けられている。更に、係合用弾性部13の前方には、一対の位置決め用段部15、15が備えられる。

第2図(a)及び第2図(b)に示すように、ノブ3は透光性の合成樹脂により形成される一次側部材16と、遮光性の合成樹脂により形成される二次側部材17とからなり、二次側部材17には透光用の穴(第1図参照)が明けられている。

一次側部材16は、底部18と、一対の側壁部19、20と、後壁部21とを備え、その上部が開放されている。

そして、一方の側壁部19の上端部には、一次側部材16の前端を起点とする長手方向の切欠き22が設けられ、切欠き22の後端に位置決め用

型割れは、第2図(b)中矢印B、B'方向に行うことができ、二次側部材17も2つの割型で成形が行なえる。

レバー1へのノブ3の装着に際しては、ノブ3を把持して前方へ押し込むと、レバー1の係合用弾性部13が溝6側へ撓められながら、ノブ3がレバー1に徐々に嵌合され、ノブ3の前記位置決め用段部23がレバー1の位置決め用突出部14に当止された段階で、係合用弾性部13がそれ自体の弾力により外側方へ復動して係合用溝部24に係入し、ノブ3とレバー1がワンタッチで結合される(第1図)。なお、ノブ3とレバー1が結合した時点で、ノブ3の前端がレバー1の前記位置決め用段部15、15に当接する。

次に、第2実施例を説明する。

第4図(a)及び第4図(b)に示すように、第2実施例においては、ノブ3の一次側部材16には、係合用溝部24のみを設け、二次側部材17に、第1実施例の切欠き22に対応する溝部26を設けるとともに、レバー1に、上方に立ち上がりな

段部23が形成されている。又、上記一方の側壁部19には、その前縁より後方にかたよった位置に、水平断面三角形状の係合用溝部24が形成されている。この一次側部材16の成形においては、第2図(a)中矢印A、A'方向に、金型(不図示)の型割れが行われる。従って、係合用溝部24があっても2つの割型で成形が行なえる。

一方、二次側部材17は、一次側部材16の成形後に、一次側部材16をインサートして成形される。この二次側部材17は、閉じた横断面形状に形成され、その上部と、一次側部材16との間に、レバー1が嵌合する凹部25が画成される。

この二次側部材17の成形時には、切欠き22、溝部24及び凹部25内に溶湯が流入しないように、金型によって保護される。この場合の金型は、切欠き22と凹部25とから成る形状に形成されたものであり、一次側部材16を金型に嵌めた場合、溝部24は空洞になっているが、金型によって塞がれているため溶湯が流入することがない。その場合、二次側部材17の成形における金型の

から側方へ突出する位置決め用突出部27(第5図参照)を設け、該突出部27を上記溝部26の後端の段部28に当止するようにしたものである。この場合、溝部26は、溝部24と異なり、ノブ3の前端(開口端)に連続して設けるものであるから、閉じた横断面の二次側部材17に溝部26を成形しても、その成形に何ら困難は生じない。すなわち、この場合の金型は、凹部25と溝部26とから成る形状に形成されたものであり、又、一次側部材16を金型に嵌めた場合、溝部24は空洞になっているが、金型によって塞がれているため、溶湯が流入することがない。

4. 図面の簡単な説明

第1図は、本発明の第1実施例に係る自動車用空調装置用コントロール装置の要部水平断面図、

第2図(a)、第2図(b)は、夫々第1図の装置におけるコントロールノブの一次側部材及び二次側部材を示す斜視図、

第3図は、第1図の装置の斜視図、

第4図(a)、第4図(b)は、夫々本発明の第2

実施例におけるコントロールノブの一次側部材及び二次側部材を示す斜視図、

第5図は本発明の第2実施例におけるコントロールレバーの要部斜視図である。

1…コントロールレバー、

3…コントロールノブ

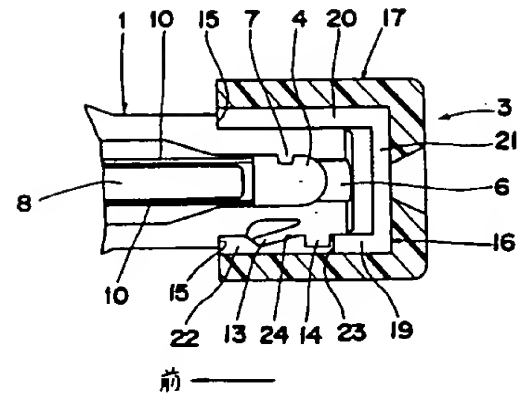
13…係合用弾性部、14…位置決め用突出部、

16…一次側部材、17…二次側部材、

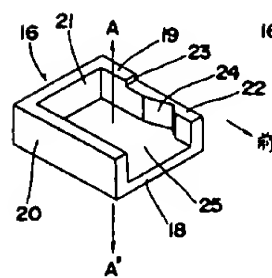
23…位置決め用段部、24…係合用溝部。

特許出願人 株式会社ユージン

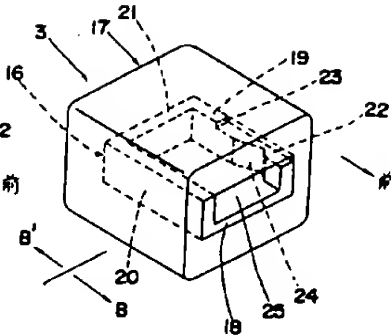
第1図



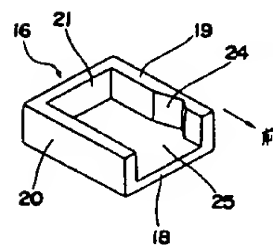
第2図(a)



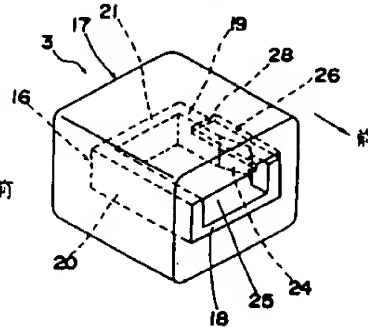
第2図(b)



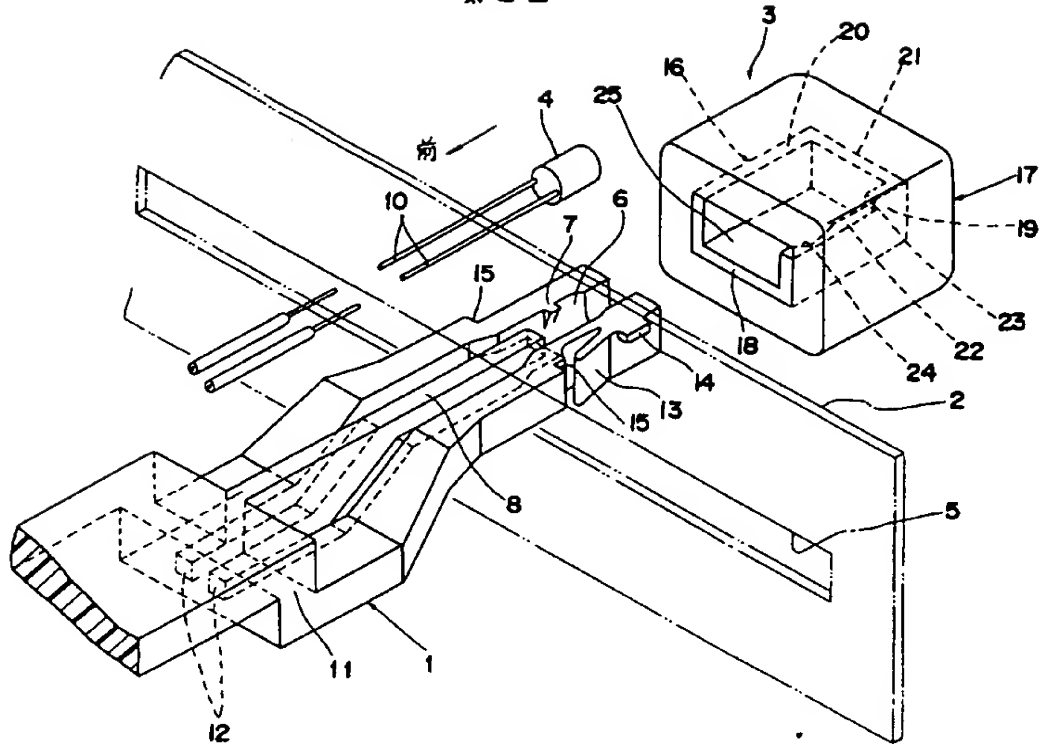
第4図(a)



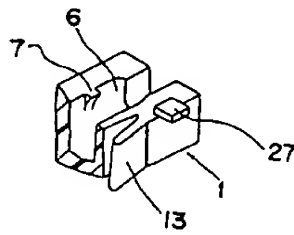
第4図(b)



第3圖



第5圖



CLIPPEDIMAGE= JP403246114A

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TITLE: MANUFACTURE OF CONTROL KNOB

PUBN-DATE: November 1, 1991

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YUHSIN CO LTD

COUNTRY

N/A

APPL-NO: JP02188034

APPL-DATE: July 18, 1990

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ABSTRACT:

PURPOSE: To enable fine work with hard material in manufacturing a control knob for an automobile air conditioner by molding an upper-side and front-side opening member to fit and hold a control lever with light transmitting resin and insert-molding the member with light transmitting resin so as to cover the openings thereof.

CONSTITUTION: A knob 3 is made up of a primary-side member 16 of light transmitting synthetic resin and a secondary-side member 17 of light transmitting synthetic resin. The primary-side member 16 has a recessed portion 25 to which a control lever is fitted and an engaging groove 24 with

which the engaging protrusion of the control lever is engaged, and molded with a pair of longitudinally split type primary molds in such a shape that the upper face and the front face are open. The primary-side member 16 is set in a longitudinally split type secondary mold for molding the secondary-side member 17 and insert- molded, mold the secondary-side member 17 so as to cover the opening of the primary-side member 16. In this way, hard material can be used and fine work can be done.

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METHOD FOR MANUFACTURING CONTROL KNOB
[Kontororu Nobu no Seizohoho]

Kiyoshi Shirogane

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D. C. January 2002

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APPLICANT	(71): YUHSIN CO., LTD.
TITLE	(54): METHOD FOR MANUFACTURING CONTROL KNOB
FOREIGN TITLE	[54A]: [Kontororu Nobu no Seizohoho]

SPECIFICATION

1. Title

Method for Manufacturing Control Knob

2. Claims

A method for manufacturing a control knob that is to be attached to the tip of a control lever (1) by mating with the elastic mating projection (13) formed at the tip of the control lever (1),

said method comprising a step wherein a primary member (16) is molded from a light-transmitting hard material with a first mold comprised of a pair of split molds so as to form a concave part (25) into which the tip of the control lever (1) is fitted and a mating groove (24) with which the elastic mating projection (13) mates and so as to make openings at the top and front, at a minimum, of the member and

a step wherein, after this primary member (16) is fitted into one split mold of a second mold comprised of a pair of split molds, with the concave part (25) and the open ends being blocked and the mating groove (24) being covered from the top, the other split mold is fitted to this split mold, and a secondary member having an opening hole at the back end is molded from a light-shielding resin material, with the primary member inserted in the mold.

3. Detailed Description of the Invention

[Industrial Field of Application]

The present invention pertains to a method for manufacturing control knobs used for automotive air-conditioning units, etc.

[Prior Art]

In the prior art, well known as a control device for, for example, automotive air-conditioning units is one in which a control lever is mounted on the main body of the device in a rotatable manner, said lever having a synthetic-resin knob attached to its tip, thereby controlling the temperature of the air-conditioning air, the air-ejection position, etc., by holding of the knob and rotation of the control lever.

[Problems that the Invention Intends to Solve]

According to the prior art, knobs are attached to control levers with screws, but this attachment method is troublesome and does not produce a nice appearance, and it also increases the component count.

Accordingly, a method was proposed according to which a mating groove was formed on the knob side, while a mating projection that was to be inserted into the aforesaid groove was formed on the lever side, thus joining the knob with the lever with a one-touch operation. According to this method, however, the aforesaid groove must be formed at the position away from the aperture of the lever-mating-use concave portion of the knob, which fact makes the knob formation difficult.

More specifically, the aforesaid groove is formed using Murinuki [as transliterated, it may mean "pinch cut"], slide core, or similar method, but the former method is not suitable for hard material, and, with the latter method, it is difficult to form fine grooves.

[Means of Solving the Problems]

To solve the aforesaid problems, the present invention provides a method for manufacturing a control knob that is to be attached to the tip of a control lever by mating with the elastic mating projection formed at the tip of the control lever,

said method comprising a step wherein a primary member is molded from a light-transmitting hard material with a first mold comprised of a pair of split molds so as to form a concave part into which the tip of the control lever is fitted and a mating groove with which the elastic mating projection mates and so as to make openings at the top and front, at a minimum, of the member and

a step wherein, after this primary member is fitted into one split mold of a second mold comprised of a pair of split molds, with the concave part and the open ends being blocked and the mating groove being covered from the top, the other split mold is fitted to this split mold, and a secondary member having an opening hole at the back end is molded from a light-shielding resin material, with the primary member inserted in the mold.

[Effects of the Invention]

According to the present invention, a control knob of the one-touch insertion type is formed in two steps, and the groove used for mating with the control lever is formed on the primary member in which the side corresponding to a minimum of one end of said groove is open. Therefore, even when a hard material is used for the control knob or when the mating groove is small, the control knob can be easily produced by a common molding method using a pair of molds, without relying on such means as Murinuki, slide core, and the like, and the dimensional precision of the mating groove also improves.

Furthermore, by forming positioning projections and steps on the control lever and control knob, the lever and the knob are positioned securely, thus reducing the play between the two components.

[Embodiments]

Fig. 3 illustrates an embodiment control device of the present invention for automotive air-conditioning units. Said device has a synthetic-resin control lever (1), which is supported by a board (not shown), and a control knob (3), which is attached outside the panel (2) to the tip of the control lever (1). Said control knob is made from a synthetic resin, and it houses a light-emitting diode (4) for indicating the position of the knob (3) at night and the like.

The aforesaid control lever (1) is connected to the main body of the air-conditioning unit by means of a connecting member (not shown),

such as a rod, etc., and it controls, for example, the temperature of air-conditioning air by rotary manipulation with the use of the knob (3). The aforesaid panel 2 has a long slot (5) formed for guiding the control lever (1) in a rotatable manner.

The top side of the aforesaid control lever (1) has a groove (6) formed along its lengthwise direction. In the portion that joins with the control knob (3), the groove (6) is formed in a cylindrical shape, and a light-emitting diode (4) is inserted into this cylindrical section. On this cylindrical section is also provided a retention projection (7) that is formed in one piece with the section and that prevents the light-emitting diode (4) from moving in the direction of its diameter by making contact with the top part of the light-emitting diode (4).

The part of the groove (6) that is upstream from the portion into which the aforesaid light-emitting diode is inserted has a rib (8) formed at the middle, and the rib (8) divides the groove (6) into the right and left portions. A pair of right/left lead wires (10, 10) are led from the light-emitting diode (4), and these lead wires (10, 10) extend through the grooves (6) on both sides of the rib (8), further pass through the tunnel sections (12, 12) that are contiguous to the grooves (6) and that are open in the rising part (11) of the lever, and then connect to the power source (not shown).

On the portion of the lever (1) that connects with the knob (3), a flexible elastic section (13), which projects forward obliquely from the entire area in the lever's height direction, and a positioning projection (14), which projects sideways from the upper edge of this portion, are formed in the front and rear in one piece with the lever. A pair of positioning steps (15, 15) is further provided upstream from the mating elastic section (13).

As shown in Figs. 2 (a) and (b), the knob (3) is comprised of a primary member (16) formed from a light-transmitting synthetic resin and a secondary member (17) formed from a light-shielding synthetic resin, and the secondary member (17) has a hole opened for transmitting light (see Fig. 1).

The primary member (16) has a bottom section (18), a pair of sidewall sections (19, 20), and a back-wall section (21), and its top section is open.

On the upper edge of one sidewall section (19) is provided a longitudinal notch (22) that originates from the front end of the primary member (16), and a positioning step (23) is formed at the back end of the notch (22). Further provided on the aforesaid sidewall section (19) at the position closer to the back end than to the front end is a mating groove (24) having a triangular horizontal cross-section. To mold this primary member (16), the mold (not shown) is split in the direction of A-A' in Fig. 2 (a). Therefore, it can be

molded with two split molds in spite of the presence of the mating groove (24).

Meanwhile, the secondary member (17) is formed after the formation of the primary member (16), with the primary member (16) being inserted. This secondary member (17) is formed with a closed cross-sectional shape, and a concave part (25) into which the lever (1) fits is formed between the top part and the primary member (16). At the time of molding this secondary member (17), the molten material is prevented from running into the notch (22), groove (24), and concave part (25) by the mold. The mold used here is formed into a shape comprised of the shapes of the notch (22) and concave part (25). When the primary member (16) is inserted into the mold, the groove (24) stays hollow but is covered by the mold; therefore, the molten material does not flow into it. In this case, the mold split for the mold used for forming the secondary member (17) can be formed in the direction of B-B' in Fig. 2 (b). Thus, the secondary member (17) is also molded with two split molds.

To attach the knob (3) to the lever (1), the knob (3) is held and inserted forward. In this process, as the mating elastic section (13) is flexed toward the groove (6), the knob (3) is gradually fitted into the lever (1), and the aforesaid positioning step (23) of the knob (3) makes contact with and is stopped by the positioning projection (14) of the lever (1), at which point the elastic mating section (13)

springs back outward by its own elasticity and thus is inserted into the mating groove (24); thus, the knob and lever (1) are connected in a one-touch operation (Fig. 1). When the knob (3) and lever (1) are connected, the front end of the knob (3) makes contact with the aforesaid positioning steps (15, 15) of the lever (1).

The following explains a second embodiment.

As shown in Figs. 4 (a) and (b), according to the second embodiment, only the mating groove (24) is provided on the primary member (16) of the knob (3), and a groove (26) corresponding to the notch (22) in the first embodiment is formed on the secondary member (17). Furthermore, on the lever (1) is formed a positioning projection (27) (see Fig. 5) that projects sideways as it rises upward, and this projection (27) makes contact with the step (28) located at the back end of the aforesaid groove (26). In this case, groove 26, unlike groove 24, is formed contiguously with the front end (opening end) of the knob (3); therefore, forming the groove (26) on the secondary member (17) having a closed cross-section does not pose any problem to the molding process. More specifically, the mold used in this case has a shape comprised of the shapes of the concave part (25) and the groove (26), and, when the primary member (16) is fitted into the mold, the groove (24) stays hollow but covered by the mold; therefore no molten material flows into it.

4. Brief Explanation of the Drawings

Fig. 1 is a horizontal cross-section of the essential parts of the first-embodiment control device of the present invention for automotive air-conditioning units.

Figs. 2 (a) and (b) are perspective views that illustrate, respectively, the primary member and secondary member of the control knob of the device shown in Fig. 1.

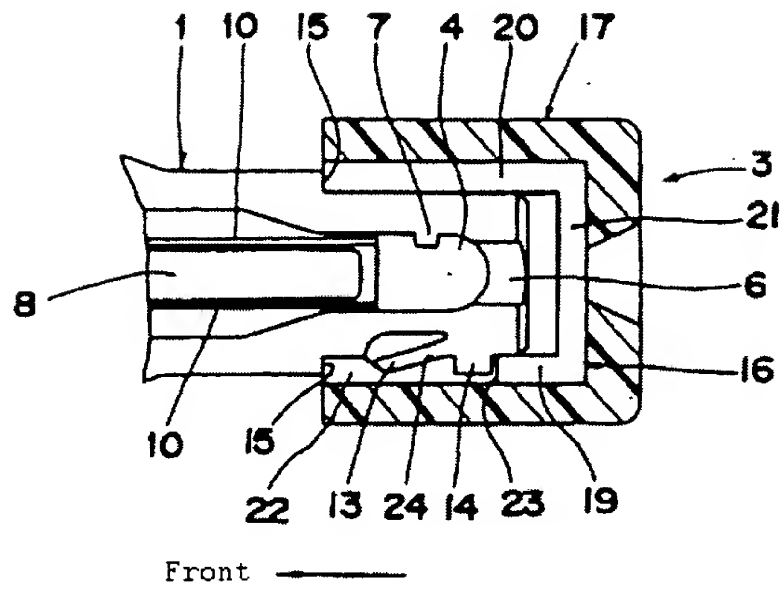
Fig. 3 is a perspective view of the device shown in Fig. 1.

Figs. 4 (a) and (b) are perspective views that illustrate, respectively, the primary member and secondary member of the control knob of the second embodiment of the present invention.

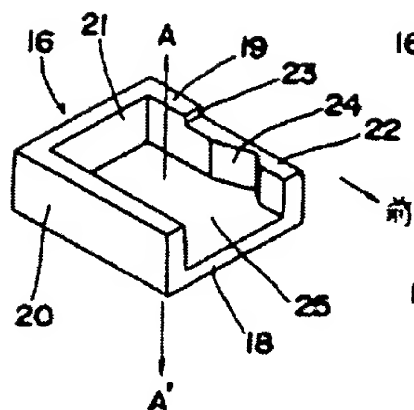
Fig. 5 is a perspective view of the essential parts of the control lever of the second embodiment of the present invention.

- 1... control lever
- 3... control knob
- 13.. elastic mating section
- 14.. positioning projection
- 16.. primary member
- 17.. secondary member
- 23.. positioning step
- 24.. mating groove

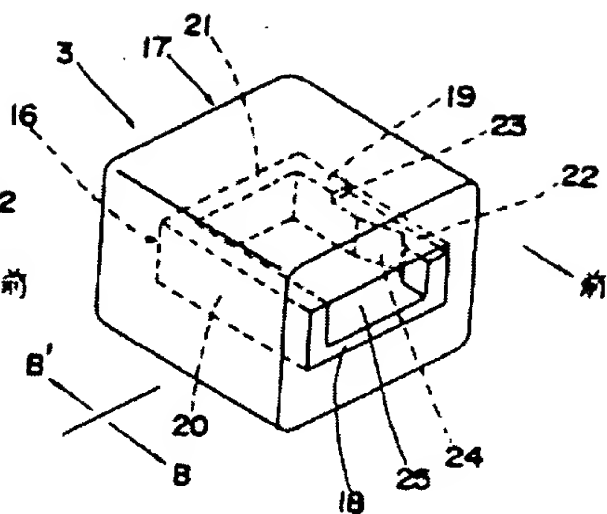
[FIG. 1]



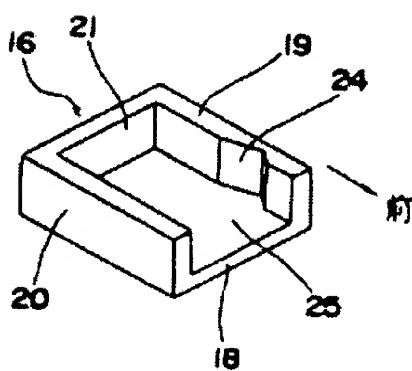
[Fig.2 (a)]



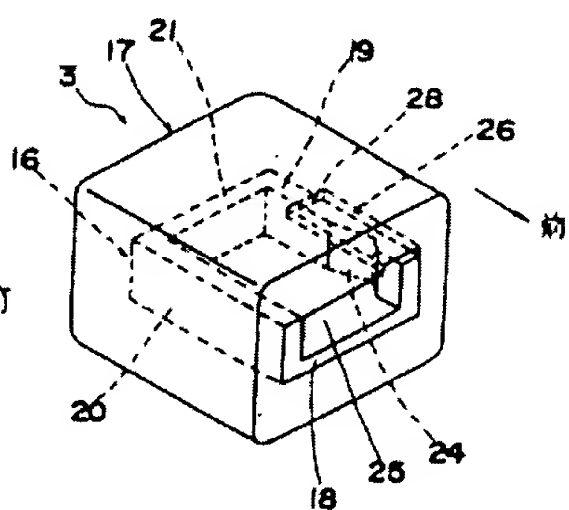
[Fig.2 (b)]



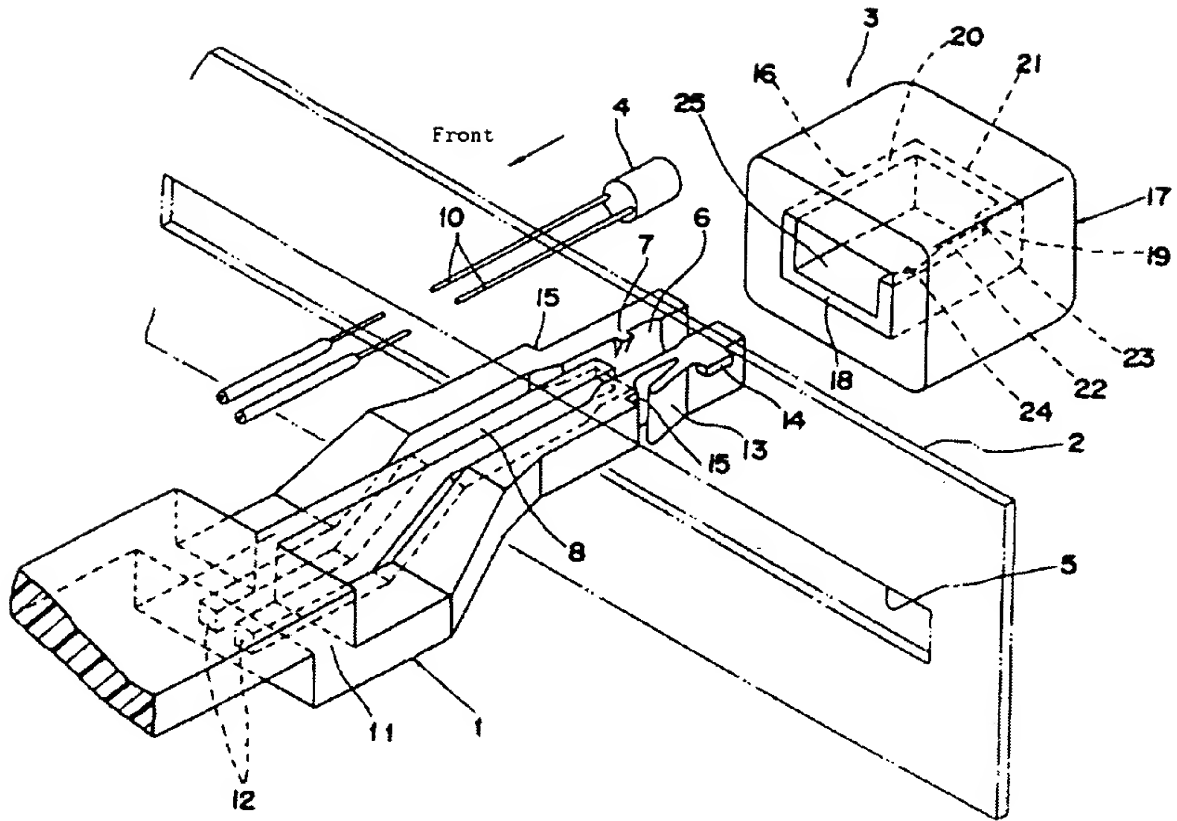
[Fig.4 (a)]



[Fig.4 (b)]



[Fig. 3]



[Fig. 5]

